

## EYE DISORDERS

Beena Davis, RN, MSN  
N243

1 1

### Objectives

- Describe the pathophysiology, etiology, incidence, symptoms, and therapeutic management for: Glaucoma, Cataract, Macular degeneration, Retinal detachment
- Documentation of observations for a patient with eye disorders
- Geriatric considerations
- Structural and functional changes

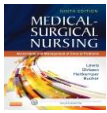
2 2

### Objectives...

- Myotic and mydriatic medications: actions/indications/side effects
- Cataract surgery: postoperative care
- Cataract extraction: discharge plan
- Psychological adaptations to decreased vision
- Assistive devices: use/care/pt education
- Chronic glaucoma: teaching plan

3 3

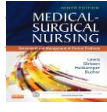
## Required Reading



### Med Surg Textbook

p# 368-377 Chapter 21

p# 393-401 Chapter 22



### Study Guide

p# 75-79 Chapter 21

p# 80-84 Chapter 22



### Pharmacology Textbook

p# 710-722, 725-726

4 4

---

---

---

---

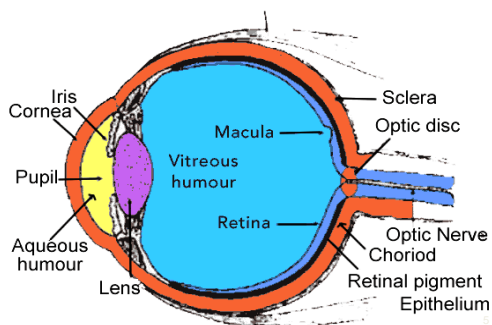
---

---

---

---

## Review



---

---

---

---

---

---

---

---

## Review

- Assessment of visual system
  - Refer p# 371-377, table 21-4
- Focused assessment
  - Refer p# 370
- Gerontologic differences in assessment
  - Refer p# 371, table 21-1

6 6

---

---

---

---

---

---

---

---

## Glaucoma

- A group of disorders characterized by  
↑ IOP and the consequences of elevated  
pressure, optic nerve atrophy, and  
peripheral visual field loss
- Normal IOP: 10-21 mmHg

7 7

## Epidemiology

- Second leading cause of permanent  
blindness in the U.S.
- Leading cause of blindness in African  
Americans
- Incidence increase with age
- Prevention: early detection & treatment

8 8

## Etiology and Pathophysiology

- When the rate of aqueous production  
(inflow) is greater than the rate of  
aqueous reabsorption(outflow), IOP rise  
above the normal limits.

9 9

## Major categories of glaucoma

- Primary open-angle glaucoma (POAG)
- Primary angle-closure glaucoma (PACG)

10 10

## Primary open-angle glaucoma

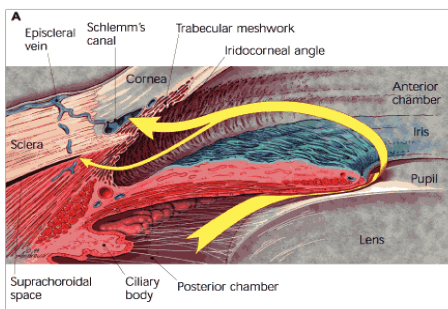
- Most common type
- Outflow of aqueous humor is decreased in the trabecular meshwork
- Drainage channels become clogged and damage to the optic nerve can then result

### C/M:

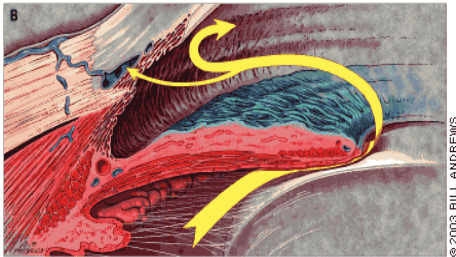
- Develop slowly without symptoms
- Tunnel vision
- IOP: 22-32 mm Hg

11 11

## Normal outflow



## Open-angle glaucoma



13 13

---

---

---

---

---

---

---

---

## Tunnel vision



14 14

---

---

---

---

---

---

---

---

## Primary angle-closure Glaucoma

- Reduction in the outflow of aqueous humor that results from angle closure
- Lens bulging forward due to aging process

15 15

---

---

---

---

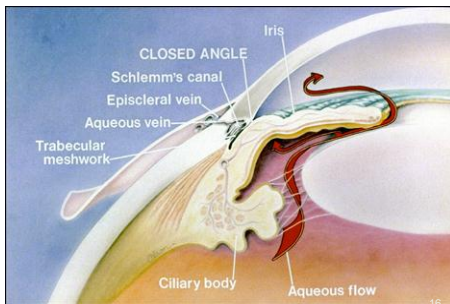
---

---

---

---

## Angle-closure Glaucoma



---

---

---

---

---

---

---

## Acute angle-closure glaucoma

### Causes:

- Drug induced mydriasis, emotional excitement, or darkness

### C/M:

- Sudden, excruciating pain in or around the eye, N/V
- IOP:  $\geq 50$  mm Hg
- Colored halos around lights, blurred vision, ocular redness

17 17

---

---

---

---

---

---

---

## Subacute/chronic angle-closure glaucoma

- Appear gradually
- May report a h/o colored halos around lights, blurred vision, ocular redness or eye or brow pain

18 18

---

---

---

---

---

---

---

## Diagnostic studie

- H&P
- Visual acuity
- Tonometry
- Ophthalmoscopy
- Slit lamp microscopy
- Gonioscopy
- Visual field perimetry



---

---

---

---

---

---

---

## Slit lamp



A slitlamp is used to view the interior of the eye

ADAM.  
20 20

---

---

---

---

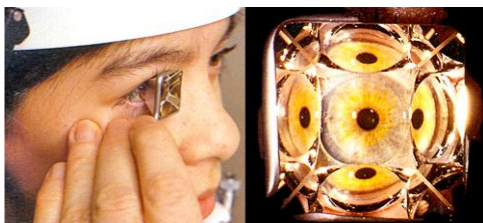
---

---

---

## Gonioscopy

- Allows better visualization of the anterior chamber angle.



---

---

---

---

---

---

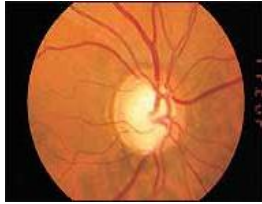
---

## Optic disc cupping

- Normal



- Typical thinning of inferior neuroretinal rim, forming a "notch"



---

---

---

---

---

---

---

## Collaborative care

### Chronic Open-angle glaucoma

Drug therapy (refer p#400 table 22-7)

- Beta adrenergic blockers
  - timolol (Timoptic)
- Alpha adrenergic agonists
  - epinephrine (Eppy)
- Cholinergic agents (Miotics)
  - pilocarpine (Pilocar)
- Carbonic anhydrase inhibitors (CAI)
  - acetazolamide (Diamox)

23 23

---

---

---

---

---

---

---

## Collaborative care...

### Chronic Open-angle glaucoma

Surgical & Non surgical therapy

- Argon laser trabeculoplasty (ALT)
- Trabeculectomy/filtration surgery

24 24

---

---

---

---

---

---

---



## Non-surgical treatment

### Argon laser trabeculoplasty (ALT)

- Used when medications are not successful or patient is not using drug therapy
- Outpatient procedure
- The laser stimulates scarring and contraction of the trabecular meshwork, which opens the outflow channels
- Reduces IOP approx 75%

25 26

## Surgical treatment

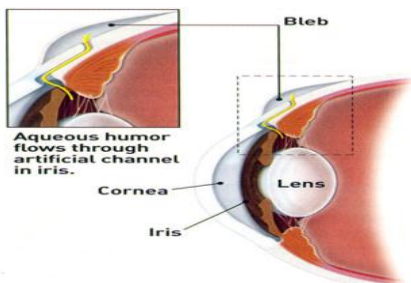
### Trabeculectomy

- Removes part of the iris and trabecular meshwork and closes the scleral flaps loosely
- Success rate 75% - 85%



26

### Trabeculectomy



27 27

## Collaborative care...

### **Acute angle-closure glaucoma-**

#### **An ocular emergency**

- Topical cholinergic agent (Miotics)
  - Pilocarpine (Pilocar)
- Oral or IV hyperosmotic agents
  - mannitol (Osmitol)
- Long-term treatment
  - Laser peripheral iridotomy
  - Surgical iridectomy



---

---

---

---

---

---

---

## Nursing management

### **Assessment**

- Assess the pt's ability & psychologic reaction
- Determine visual acuity, visual fields, IOP, and fundus changes

### **Diagnoses**

- Risk for injury r/t visual acuity deficits
- Self-care deficits r/t visual acuity deficits
- Noncompliance r/t the inconvenience and s/e of medications

29 29

---

---

---

---

---

---

---

## Nursing management...

### **Implementation**

- Health promotion
- Acute intervention
- Ambulatory and home care

### **Teaching plan**

- Avoid any activity that increase IOP
- Eye drops instillation
- Compliance & wear ID bracelet
- Avoid self-treatment

30 30

---

---

---

---

---

---

---

## Gerontologic considerations

- Additive effect of beta adrenergic blocking (BAB) glaucoma agents
- BAB contraindications
- Problems with hyperosmolar agents
- Aspirin & CAI
- Problems with alpha adrenergic agonists
- Eye drops & systemic absorption

31 31

## Cataract

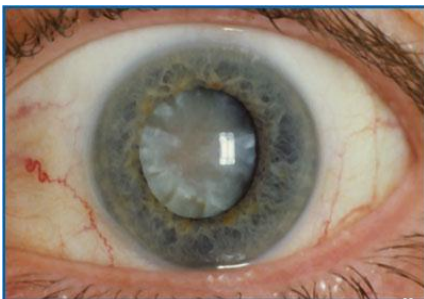
**Definition:** Opacity within the lens

**Etiology & pathophysiology:**

- Age related (senile cataracts)
- Other factors:
  - Blunt or penetrating trauma
  - Congenital factors
  - Radiation
  - Drugs
  - Ocular inflammation
  - DM

32 32

## Cataract...



## Cataract...

### **C/M:**

- Decreased vision
- Abnormal color perception
- Glare

### **Diagnostic studies:**

- H&P, visual acuity, visual field perimetry
- Ophthalmoscopy, slit lamp
- Glare testing
- Keratometry & A-scan ultrasound

34 34

---

---

---

---

---

---

---

## Cataract...



35 35

---

---

---

---

---

---

---

## Collaborative care

### **Nonsurgical therapy**

- Change prescription of glasses
- Strong reading glasses or magnifiers
- Increased lighting
- Lifestyle adjustment

36 36

---

---

---

---

---

---

---

## Surgical therapy

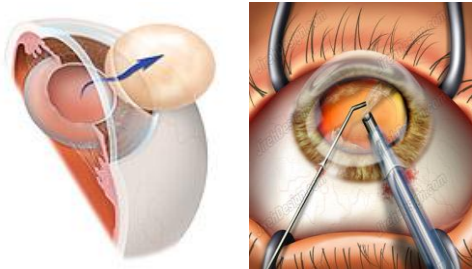
### Cataract extraction

- Extracapsular (ECCE): anterior capsule is opened and the lens nucleus and the cortex are removed, leaving the remaining capsular bag intact
  - Phacoemulsification: nucleus is fragmented by ultrasonic vibration and aspirated from inside the capsular bag

37 37

## ECCE & Phacoemulsification

• A.



38 38

## Nursing management

### Assessment

- Visual acuity
- Psychosocial impact of visual disability
- Level of knowledge

### Diagnosis

- Anxiety r/t lack of knowledge about the surgical and postoperative experience
- Self-care deficit r/t visual deficit

39 39

## Nursing management

### Intervention

- Health promotion
- Acute intervention
  - Pre and post operative care
  - Discharge teaching
- Ambulatory and home care

40 40

## Preoperative care

- H & P
- Eyedrops
  - Antibiotics
  - NSAID
  - Mydriatics -phenylephrine
  - Cycloplegics-tropicamide, atropine
- No food or fluids 6 to 8 hrs before surgery
- Antianxiety medication

41 41

## Postoperative care

- Eye drops
  - Antibiotic & Corticosteroid
- Activity restrictions
- Night time eye shielding

### Discharge teaching

- Eye hygiene & eye drops administration
- S/S of infection
- Activity restriction
- Follow up

42 42

## Ambulatory and home care

- Modify lifestyle to accommodate the visual deficit
- Long-term eye care
- Verbal & written instructions
- Involvement of the caregiver

43 43

## Gerontologic considerations

- Loss of independence
- Lack of control over life
- Changes in self-perception
- Societal devaluation
- Emotional support and encouragement
- Specific suggestions to allow maximum level of independent function
- Outpatient surgery

44 44

## Age-related macular degeneration (AMD)

Degenerative disease of the central portion of retina (macula) results in loss of central vision.

### Two forms

- **Dry (nonexudative)**-macular cells start to atrophy, leading to a slowly progressive and painless vision loss
  - Close vision tasks becoming more difficult
- **Wet (exudative)**-more severe; rapid onset; development of abnormal blood vessels in or near the macula

45 45

## Etiology

- Aging
- Genetic
- Long term exposure to UV light
- Hyperopia
- Cigarette smoking
- Light-colored eyes
- Nutritional

46 46

## Pathophysiology

- Dry AMD-abnormal accumulation of *drusen* in the retinal pigment epithelium>>atrophy and degeneration of macular cells
- Wet AMD-growth of new blood vessels from their normal location in the choroids to an abnormal location in the retinal epithelium>>new blood vessels leak>>scar tissue forms>>acute vision loss with bleeding

47 47

## Macular degeneration

- New vessels bleeding



- Drusen



48 48

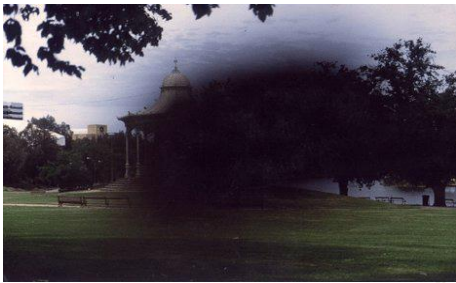


## Clinical manifestations

- Blurred vision
- Darkened vision
- Scotomas
- Metamorphopsia

49 49

## Macular degeneration



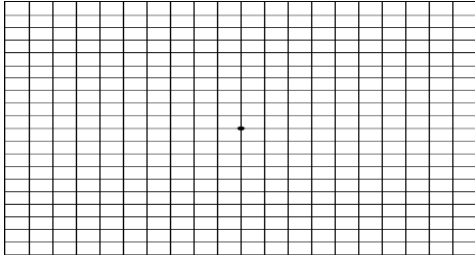
50 50

## Diagnostic studies

- Visual acuity
- Ophthalmoscopy
- Amsler grid test
- Fundus photography
- IV angiography with fluorescein and/or indocyanine green dyes

51 51

## Amsler grid test



52 52

---

---

---

---

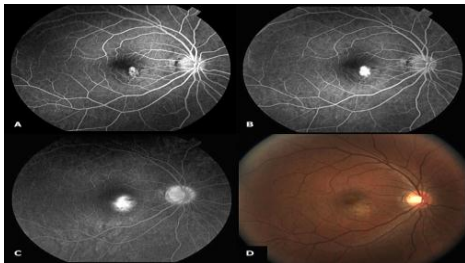
---

---

---

---

## Fluorescein angiography



53 53

---

---

---

---

---

---

---

---

## Treatment

- Photodynamic therapy (PDT)-destroys abnormal blood vessels without permanent damage to retinal pigment epithelium and photoreceptor cells
- ranibizumab (Lucentis)
- bevacizumab (Avastin)
- pegaptanib (Macugen)
- Vitamins and minerals supplements
- Smoking cessation

54 54

---

---

---

---

---

---

---

---

## Retinal detachment

Separation of the sensory retina and the underlying pigment epithelium, with fluid accumulation between the two layers

### **Risk factors**

- Increasing age
- Severe myopia
- Eye trauma
- Retinopathy (diabetic)
- Cataract surgery
- Family or personal history

55 56

---

---

---

---

---

---

---

## Etiology and Pathophysiology

**Rhegmatogenous**—most common type

- Retinal break—most common cause; interruption in the full thickness of retinal tissue
  - Retinal holes—atrophic retinal breaks that occur spontaneously
  - Retinal tears—vitreous humor shrinks during aging and pulls on the retina

56 56

---

---

---

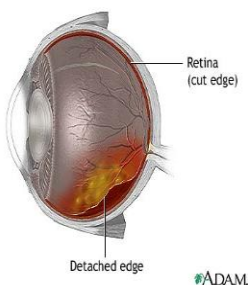
---

---

---

---

## Retinal detachment



57 57

---

---

---

---

---

---

---

## Clinical manifestations

- Photopsia (light flashes)
- Floaters
- Cobweb or hairnet
- Ring in the field of vision
- Painless loss of peripheral or central vision-  
“like a curtain” coming across the field of vision
- The area of visual loss corresponds to area of detachment

58 58

---

---

---

---

---

---

---

## Retinal detachment



59 59

---

---

---

---

---

---

---

## Diagnostic studies

- Visual acuity
- Ophthalmoscopy
- Slit lamp microscopy
- Ultrasound

60 60

---

---

---

---

---

---

---

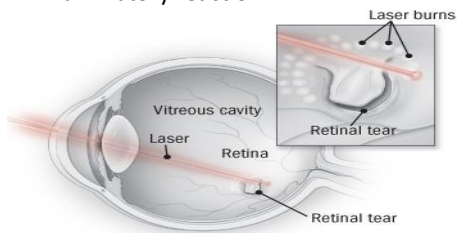
## Treatment

- Goal is to seal any retinal breaks and relieve inward traction on the retina
- Surgical Therapy
  - Laser Photocoagulation
  - Cryopexy
  - Scleral Buckling
  - Vitrectomy
  - Pneumatic Retinopexy

61 61

## Laser photocoagulation

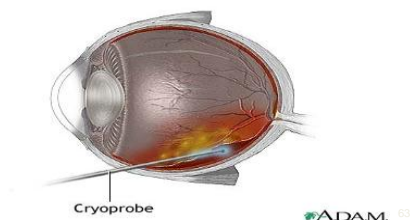
- Using an intense, precisely focused light beam, such as argon laser, to create an inflammatory reaction.



62

## Cryopexy

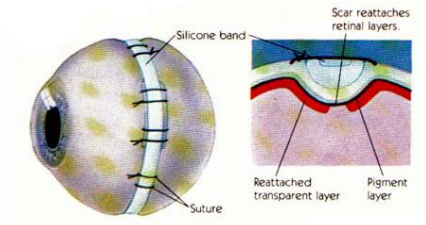
- Using extreme cold to create the inflammatory reaction that produces the sealing scar.



ADAM 63

## Scleral buckling

- Involves indenting the globe so that the pigment epithelium, choroid, and sclera move toward the detached retina.




---

---

---

---

---

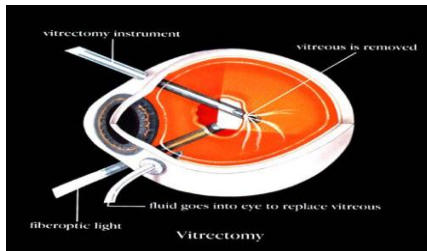
---

---

---

## Vitrectomy

- Surgical removal of the vitreous to relieve traction on the retina.




---

---

---

---

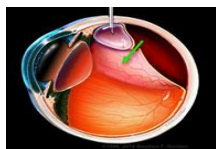
---

---

---

---

## Pneumatic Retinopexy



Gas bubble  
injected



Detached retina reattaches

---

---

---

---

---

---

---

---

## Postoperative care

- Topical agents
  - Antibiotics
  - Corticosteroids/Anti-inflammatory agents
  - Dilating agents
  - Analgesics
- Positioning
- Activity restriction
- Teaching

67 67

## Assistive devices for eye problems

- Optical devices for vision enhancement
  - Telescopic lenses & magnifiers
  - Closed circuit TV
- Nonoptical devices for vision enhancement
  - Approach magnification
  - Contrast enhancement
  - Increased lighting

68 68

## Assistance in psychological adaptation to decreased vision

- Encourage to express feelings
- Promote independence
- Assist in locating resources
- Face the person when speaking
- Avoid glare & use bright colors
- Use large prints
- Place items within the visual field

69 69

## References



1. Kee, J. L., Hayes, E. R. & McCuistion, L. E (2014). *Pharmacology: A Nursing Process Approach*. (8th ed.). St. Louis:Elsevier.
2. Lewis, S.L., Heitkemper, M.M., Dirksen, S.R., Camera, I.M., & Bucher. L. (2014). Visual and auditory problems. In *Medical Surgical Nursing: Assessment and Management of Clinical Problems*. (9th ed.).St. Louis:Elsevier.

70 70

---

---

---

---

---

---

---